

Intelligent Variable Emittance Panels Using New, ?True? Solid Electrolyte, Phase I

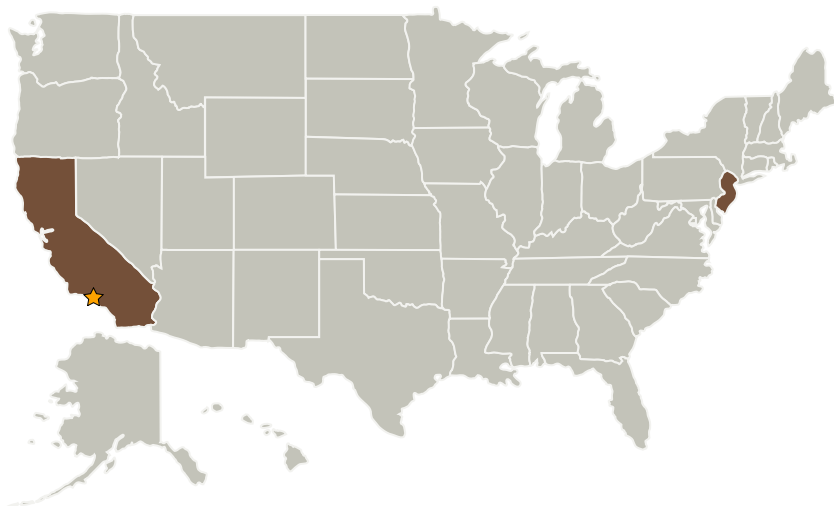
Completed Technology Project (2003 - 2003)



Project Introduction

This firm has, in ongoing work in collaboration with the Air Force, NASA and JPL, developed a unique Variable Emittance technology based on the electrochromism of unique Conducting Polymers. This comprises thin (< 0.5 mm), flexible, lightweight (0.16 g/cm^2), variable area (0.5 cm^2 to 0.5 m^2), very low cost flat panels. Delta Emittance (DE) of 0.33 in space-qualified devices, and 0.53 in vacuum-durable unsealed devices, has been demonstrated. All space durability tests e.g. thermal vacuum, gamma-radiation and solar wind have been passed. A 90 cm^2 panel and Controller are scheduled to fly on NASA's ST5 microsatellite mission in 2004. A key technical barrier of this technology has however been the need to encapsulate and hermetically seal devices in CsI windows, due to a semi-solid electrolyte that does not function when completely desiccated. This causes the DE of > 0.53 in unsealed devices to fall to < 0.35 in sealed devices. The use of a just-discovered, truly solid, room temperature molten salt electrolyte compatible with our electrochromic system will permit the use of unsealed devices, allowing DE of 0.53. Intelligent design, with embedded sensors reading Emittance directly, and coatings reducing Solar Absorptance to < 0.2 , are also planned.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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| Organizations Performing Work | Role | Type | Location |
|----------------------------------|-------------------------|---|----------------------|
| ★ Jet Propulsion Laboratory(JPL) | Lead Organization | NASA Center | Pasadena, California |
| Ashwin-Ushas Corp, Inc. | Supporting Organization | Industry Small Disadvantaged Business (SDB) | Holmdel, New Jersey |

Primary U.S. Work Locations

| | |
|------------|------------|
| California | New Jersey |
|------------|------------|

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Manager:

Celestino Jun Rosca

Principal Investigator:

Prasanna Chandrasekhar

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.2 Thermal Control Components and Systems
 - └ TX14.2.3 Heat Rejection and Storage